PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 :
F16S 3/02, E06B 1/20, 1/30

A1

(11) International Publication Number: WO 00/37846

(43) International Publication Date: 29 June 2000 (29.06.00)

(21) International Application Number: PCT/GB99/04373

(22) International Filing Date: 22 December 1999 (22.12.99)

(30) Priority Data:

9828271.8	22 December 1998 (22.12.98)	GB
9924282.8	14 October 1999 (14.10.99)	GB

(71) Applicant *(for all designated States except US)*: ULTRAFRAME (UK) LIMITED [GB/GB]; Enterprise Works, Salthill Road, Clitheroe, Lancashire BB7 1PE (GB).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: RICHARDSON, Christopher [GB/GB]; 4 Willow Drive, Barrow, Clitheroe, Lancashire BB7 9FG (GB).

(74) Agent: ROYSTONS; Tower Building, Water Street, Liverpool L3 1BA (GB).

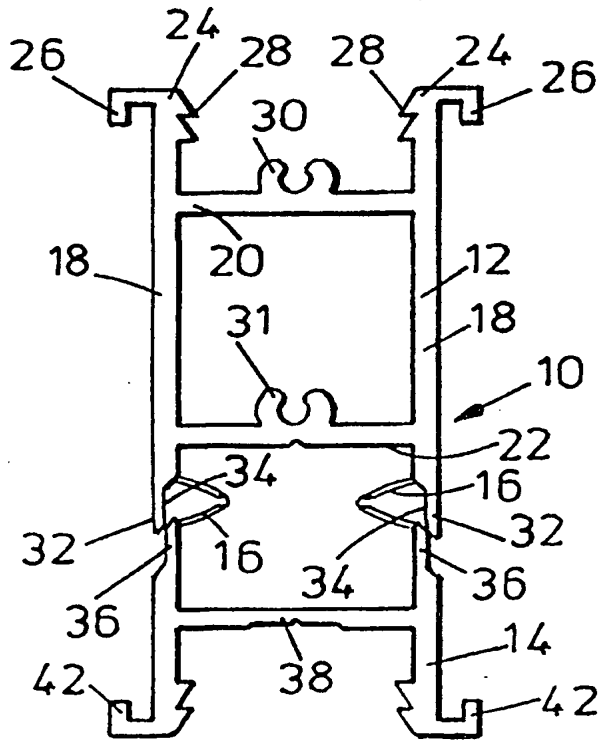
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: STRUCTURAL FRAME MEMBERS

(57) Abstract

A structural frame member that has two parts (12, 14) connected by at least one collapsible part (16), whereby the two parts can be drawn towards each other to trap an item between spaced formations (26, 42) extending from sides of said parts.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

TITLE: Structural Frame Members

DESCRIPTION

This invention concerns structural frame members and is particularly concerned with structural frame members as mullions for supporting window frames.

An object of this invention is to provide structural frame members for forming frameworks that can retain, for example, window frames or door frames.

According to this invention there is provided a structural frame member that has two parts connected by at least one collapsible part, whereby the two parts can be drawn towards each other to trap another item between spaced formations extending from sides of said parts, preferably to trap items on both sides of the frame member between spaced formations extending from both sides of said parts.

The two parts are preferably connected by a pair of collapsible webs and one part preferably has an end formation that fits within the other part when they are collapsed together, said parts overlapping to a certain extent, which preferably has a limit.

The spaced extending formations are preferably flanges and they may be flat or shaped. For items that have channel formations extending from their sides, the formations of the structural member may also be channel sections or other complementary formations to mate therewith. The flanges may be shaped

for gripping, such as by having a serrated or otherwise uneven surface or may be L-shaped to fit into channel formations of the item to be trapped. Faces of the flanges for abutting window frames may be provided with sealing means. Shaped slots along those faces may be provided to retain flexible sealing strips.

In a preferred embodiment of the invention, the structural frame member comprises a major part having side walls connected by a pair of spaced webs inwards from ends of the side walls and a minor part having side walls connected by a web, the two parts being connected by a pair of collapsible webs each between a pair of aligned sides of each part, whereby in an uncollapsed state items can be positioned against opposite sides of the member and in a collapsed state trapped between outwardly extending formations of the major and minor parts of the member.

Two parts of the structural member of the invention preferably each have means for retaining a cover strip for extending either side of the structural member to cover the joins with the trapped items. Preferably inner surfaces of the sides of the structural member have formations thereon, such as ribs or the like for retaining cooperating formations of said cover strips.

The cover strips may be single walled or more preferably are twin-walled especially forming multiple ducts for insulation purposes. Edges of the cover strips preferably retain gasket material or have coextruded gasket material therealong.

The structural frame members are particularly suitable for use on mullions in forming a framework to receive window frames. The framework preferably

includes a base member and a top member, such as an eaves beam. For securing top and bottom members to the structural members, webs of the structural members are preferably formed with screw ports to receive screws through the top and bottom members respectively into the structural members.

To collapse a structural member of the invention to trap items, such as window frames therein, the two parts may be drawn together by means of screws through a web of one part into a web of the other part.

The invention further comprehends a glazed structure having a framework comprising structural members of the invention with window frames mounted therebetween and trapped along sides thereof between collapsed parts of said structural members.

The structural members used on the invention may be of any suitable material. Aluminium and uPVC are preferred materials; although in the case of uPVC strengthening members, such as of aluminum or steel may be required. Such strengthening members may be moulded into one or both parts of the structural member or may be shaped to fit channels or ducts therein.

This invention will now be further described by way of example only, with reference to the accompanying drawings in which:

Figure 1 is an end view of a first structural member according to the invention in uncollapsed form;

Figure 2 shows the structural member of Figure 1 in collapsed form;

Figure 3 shows a first stage of connecting window frames to a structural member of Figure 1 and 2;

Figure 4 shows a window frame connected to the structural member of Figure 1 and 2;

Figure 5 shows a first variation on the structural member of Figure 1; and

Figure 6 shows a second variation on the structural member of Figure 1.

Referring to Figures 1 to 4 of the accompanying drawings, a structural frame member 10 comprises two parts 12, 14 connected by collapsible webs 16. The first part 12 has sides 18 connected by webs 20, 22 spaced inwardly from ends of the sides 18. Outer ends 24 have extending outwardly L-shaped flanges 26 forming channels open oppositely to the ends. Internally of the ends 24 are notches 28. The outermost web 20 has a screw port 30 and the innermost web 22 a screw port 31.

Opposite ends 32 of the sides 18 are rebated at 34. Just prior to the rebates one end of each of the collapsible webs 16 is connected and the other ends of the collapsible webs are connected to ends of the side walls 36 of the second part 14 of the frame member 10.

The second part 14 has its side walls 36 connected by a web 38. Outer ends of the side walls 36 have extending outwardly L-shaped flanges 42 that form channels open towards the flanges 26 of the first part 12 of the structural frame member. Inwardly of the ends of the side walls 36 are notches 44, inner ends of the side walls 36 are rebated on their outside to complement the rebates of the ends 32 of the sides 18 of the first part 12 of the member 10.

The member 10 is designed to be collapsed (as shown in Figure 2) to trap window frame sides 50 (see Figures 3 and 4) between respective pairs of

flanges 26 and 42 on opposite sides of the member 10. Conveniently the window frame sides have L-shaped projections 52 that fit the channels formed by the flanges 26 and 42. The structural member 10 is collapsed by screwing through the web 38 of the second part 14 into the 22 of the second part to draw the webs towards each other. As that occurs the webs 16 collapse to trap the window frame sides between the pairs of flanges 26,42. Afterwards cover strips 56 are pressed into place on the end of the member 10 to cover the joins with the window frames. The cover strips 56 have a pair of projections 58 that are shaped at their ends to pass over the notches 28 or 44 of the structural member side walls and be retained by them. Along each side of the cover strips is coextruded gasket material for sealing against the window frames.

The frame members 10 are intended to be incorporated into a framework comprising an eaves beam and a bottom beam, each of which may be secured to the member 10 by means of screws therethrough into the screw ports 30 and 31.

Turning to Figure 5 of the accompanying drawings, a variation to the frame members 10 is shown for use with window frames or panels that have no recess for the L-shaped flanges 26. Instead flanges 26' are straight and have T-section slots 68 along their inner faces to receive sealing strips 70. Then, when the frame members of Figure 5 are collapsed to capture a window frame, the flanges 26' grip and seal against the window frames.

The variation of Figure 6 has stepped flanges 26" to close against window frames as the frame member is collapsed. Sealing against the window frames is

provided by decorative cover strips 56', that are held in place not only in the same way as the cover strips 56 of the main embodiment but also by means of edges 80 that clip fit over stepped ends 82 of the flanges, and that have co-extruded or bonded flexible seals 84 along edges thereof to be compressed against the window frames.

An advantage of the frame members of the invention is that the window frames can be installed pre-glazed because no fixings have to be used through the window frame sides into the structural frame members.

CLAIMS

1. A structural frame member that has two parts connected by at least one collapsible part, whereby the two parts can be drawn towards each other to trap an item between spaced formations extending from sides of said parts.

2. A structural frame member as claimed in claim 1, wherein said parts have opposed sides and spaced formations on both sides, whereby items may be trapped on both sides of the frame member.

3. A structural frame member as claimed in claim 1 or 2, wherein the two parts are connected by a pair of collapsible webs.

4. A structural frame member as claimed in claim 1, 2 or 3, wherein one part has an end formation that fits within the other part when they are collapsed together, said parts overlapping to a limited extent.

5. A structural frame member as claimed in claim 2, 3 or 4, wherein the spaced extending formations are flanges.

6. A structural frame member as claimed in claim 5, wherein the flanges are L-shaped.

7. A structural frame member as claimed in claim 5 or 6, wherein the flanges have a gripping surface.

8. A structural frame member as claimed in claim 5, wherein abutting faces of the flanges are provided with sealing means.

9. A structural frame member as claimed in claim 8, wherein shaped slots of the flanges retain flexible sealing strips.

10. A structural frame member comprising a major part having side walls connected by a pair of spaced webs inwards from ends of the side walls and a minor part having side walls connected by a web, the two parts being connected by a pair of collapsible webs each between a pair of aligned sides of each part, each part having outwardly extending formations, whereby in an uncollapsed state items can be positioned against opposite sides of the member and in a collapsed state trapped between outwardly extending formations of the major and minor parts of the member.

11. A structural frame member as claimed in claim 10, wherein two parts of the structural member each have means for retaining a cover strip and having a cover strip for extending either side of the structural member to cover joins with trapped items.

12. A structural frame member as claimed in claim 11, wherein inner surfaces of the sides of the structural frame member have formations thereon for retaining cooperating formations of cover strips.

13. A structural frame member as claimed in claim 11 or 12, wherein the cover strips are single-walled.

14. A structural frame member as claimed in claim 11, 12 or 13, wherein the cover strips are twin-walled.

15. A structural frame member as claimed in any one of claims 11 to 14, wherein edges of the cover strips retain gasket material.

16. A structural frame member as claimed in any one of claims 11 to 15, wherein edges of the cover strips have coextruded gasket material therealong.

17. A structural frame member as claimed in any one of claims 10 to 16, wherein webs connecting side walls of the frame member are provided with screw ports.

18. A glazed structure having a framework comprising at least a pair of structural frame members spaced apart, each having two parts connected by at least one collapsible part and having spaced formations extending from sides of said parts and trapping a window frame side therebetween with the structural frame member in a collapsed state, whereby the window frame is held between the two structural frame members.

19. A structural frame member substantially as hereinbefore described with reference to as illustrated in any one of Figures 1 and 2, Figures 3 and 4, Figure 5 and Figure 6 of the accompanying drawings.

20. A glazed structure substantially as hereinbefore described with reference to and as illustrated in any one of Figures 1 and 2, Figures 3 and 4, Figure 5 and Figure 6 of the accompanying drawings.

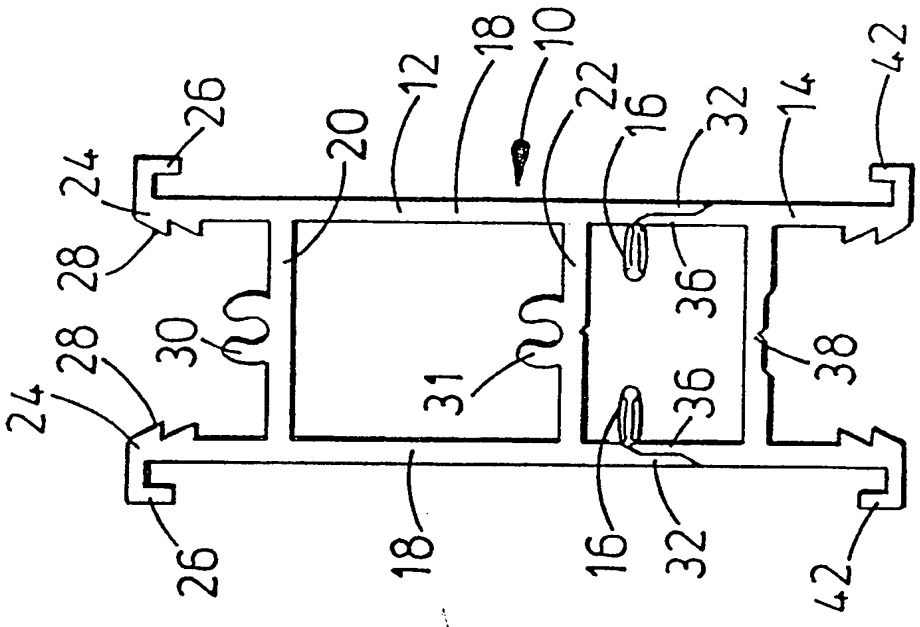

26
24
28
30
28
24
26
20
12
18
10
22
16
32
14
42
31
36
36
38
18
16
32
42

FIG. 2

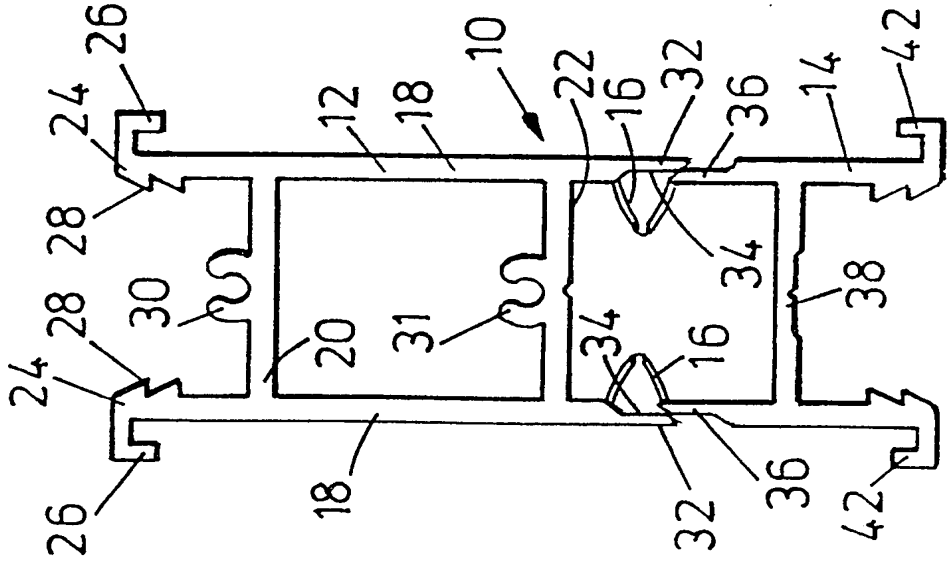

26
24
28
30
28
24
26
12
18
10
22
16
32
36
14
42
20
31
34
34
16
38
18
32
36
42

FIG. 1

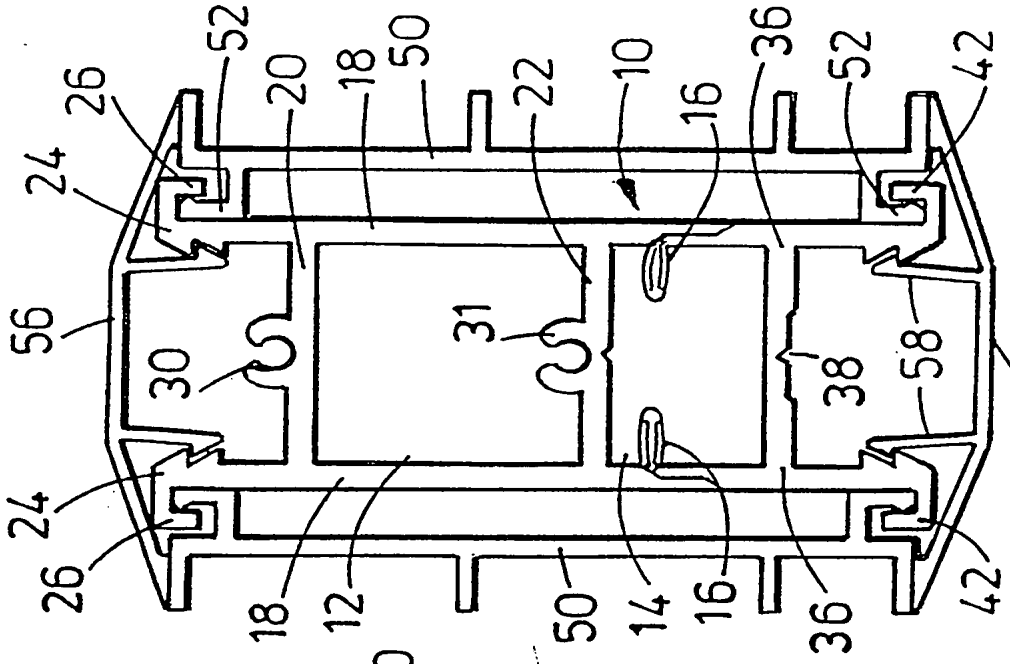

52
20
18
50
22
10
16
36
52
42
26
24
56
30
31
38
58
56
24
26
18
12
50
14
16
36
42

FIG. 4

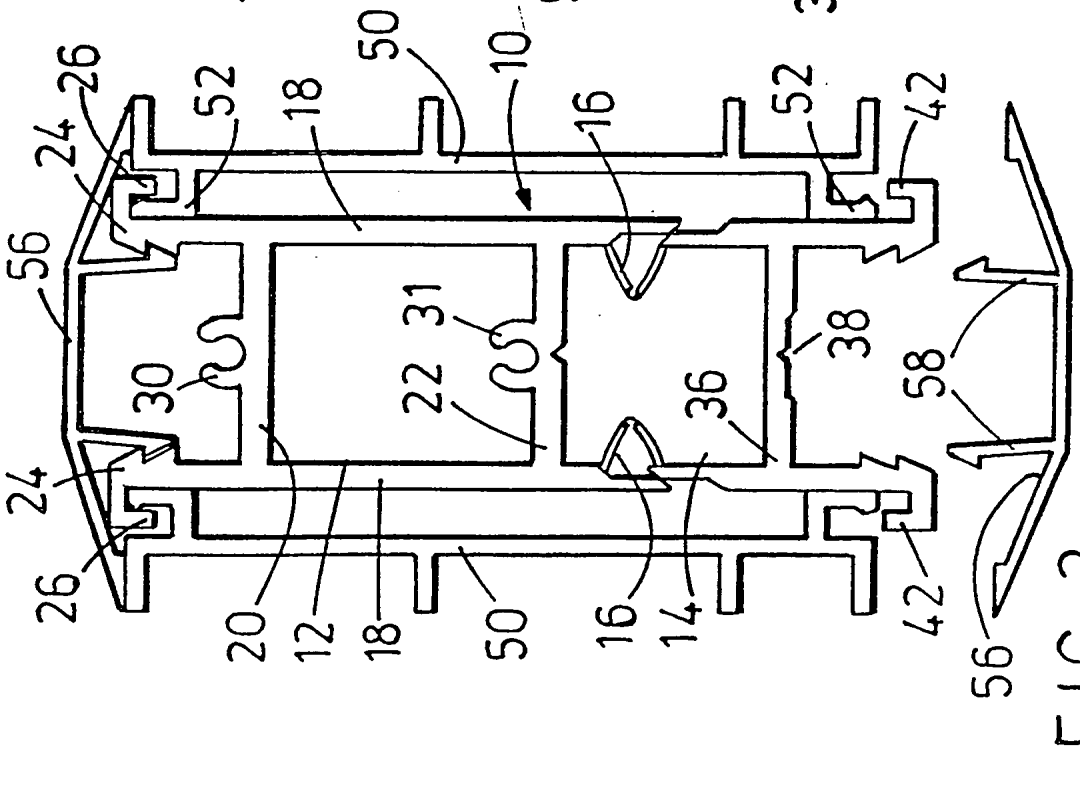

50
10
26
52
18
16
52
42
24
56
31
38
30
22
36
58
24
26
20
12
18
50
16
14
42
56

FIG. 3

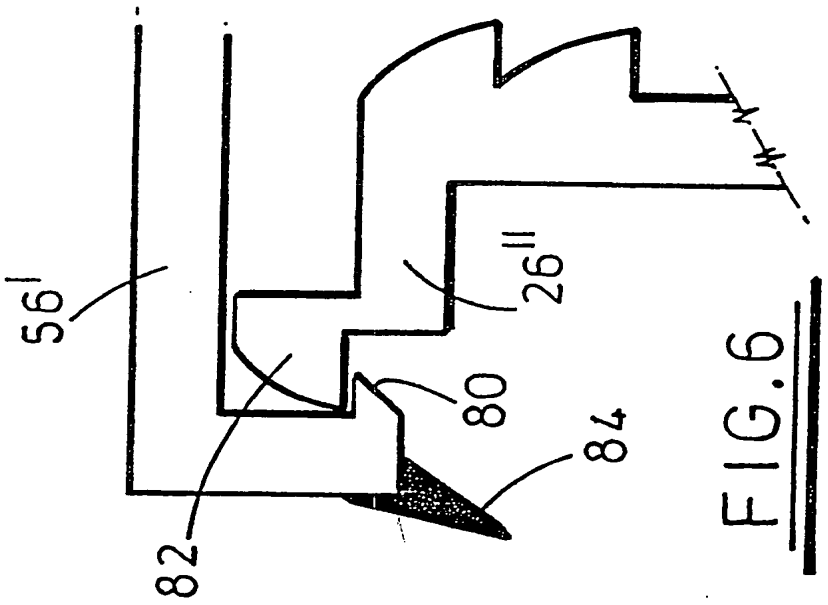


FIG.6

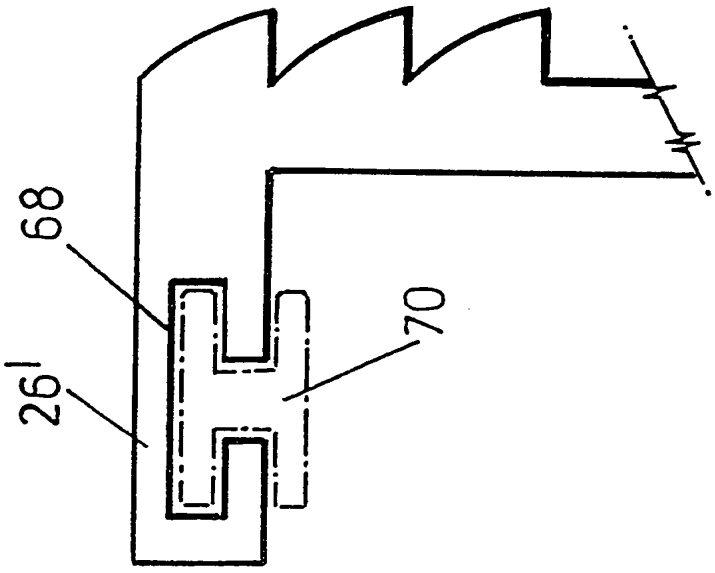


FIG.5

INTERNATIONAL SEARCH REPORT

Int. Jonal Application No
PCT/GB 99/04373

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F16S3/02 E06B1/20 E06B1/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 F16S E04B E06B F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 355 645 A (F. AZIZ FARAG) 18 October 1994 (1994-10-18) column 4, line 45 -column 5, line 22; figures 4,5,16,17	1-11, 18-20
A	FR 2 667 107 A (O.C.M.A.S.N.C. DI COSTANTINI MARINO & C.) 27 March 1992 (1992-03-27) page 6, line 12 -page 8, line 4; figures 1,2	1-10, 17-20
A	US 4 621 478 A (H.V. PHILLIPS ET AL.) 11 November 1986 (1986-11-11) abstract; figures 1-13	1,10, 18-20
A	EP 0 179 198 A (GESIKA BÜROMÖBELWERK GMBH & CO. KG) 30 April 1986 (1986-04-30) abstract; figures 1-4	1,2,5-7, 10-16

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 March 2000	06/04/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Cuny, J-M

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int ional Application No
PCT/GB 99/04373

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5355645	A	18-10-1994	WO	9404765 A	03-03-1994
			US	5579616 A	03-12-1996
FR 2667107	A	27-03-1992	IT	1242349 B	04-03-1994
			AT	399536 B	26-05-1995
			AT	186991 A	15-10-1994
			DE	4113069 A	26-03-1992
			ES	2043490 A	16-12-1993
			GR	91100381 A,B	11-09-1992
			NL	9101603 A	16-04-1992
US 4621478	A	11-11-1986	NONE		
EP 179198	A	30-04-1986	DE	3438853 A	24-04-1986
			AU	4896685 A	01-05-1986
			JP	61103406 A	21-05-1986